The Excavating Engineer

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Boston's System of Parks and Playgrounds

A Description of This City's Beautiful System and the Construction Work Now Under Way, with Particular Reference to the Part Played Therein by J. C. Coleman & Sons of Boston

IT may seem like a very far cry to consider the subject of Parks and Playgrounds as one of more than academic interest to the earth-moving fraternity. This may be the case ordinarily, but there is one very big exception. It is because of the fact that there is such an exception that we are able to dedicate this article to Boston's remarkable system of Parks and Playgrounds which have been carried to the highest degree of perfection by the Park Commission of that City and to that indefatigable worker, D. E. Coleman, President of J. C. Coleman & Sons, contractors of Boston, which concern has carried on nearly all of the large undertakings of the Park Commission of Boston during the past ten years.

The present Chairman of Boston's Park Commission, James B. Shea, has been connected with this department for a period of thirty-three years and has had the widest experience and training in park work. He is thoroughly conversant with all of the improvements which have been made in the parks of the large cities of this country during the long period which he has been connected with this particular work.

One of Mr. Coleman's 20-B's on a 10,000-yard Contract Near Eliot Square, Boston

For years Boston has been noted far and wide for the beauty of its park system and the splendid thoroughness of its playground system and the completeness of their equipment. Indeed that city has become a mecca for all those desiring to gather information and ideas as to the best method of planning and organizing such a system. So much so, that scarcely a week passes that commissions from all parts of the country do not come to Boston with a request to make a tour of investigation and to be shown how it can be done.

A Case of "Bringing Coals to Newcastle" — A 20-B Bucyrus in Roxbury, Loading Sand for Boston's Beaches

The Park Commission was first appointed on July 6, 1876, with such celebrated men among its members as T. Jefferson Coolidge, William Gray, Jr., and Charles H. Dalton. The first appropriation authorized in the same year by the mayor for maintenance of parks was the amount of $6,900. It is an interesting point of comparison that the amount available for 1922 for maintenance purposes alone was the enormous sum of $1,100,000, and today the city is the proud possessor of fifty-eight completely-equipped playgrounds and seventy-seven squares.

A perpetual fund has been donated by the public-spirited citizen, George Francis Parkman, amounting to six or seven million dollars, devoted to the maintenance of these parks and playgrounds.

But we have not as yet shown why the subject of this particular system of parks and playgrounds is of interest to the earth-moving fra-

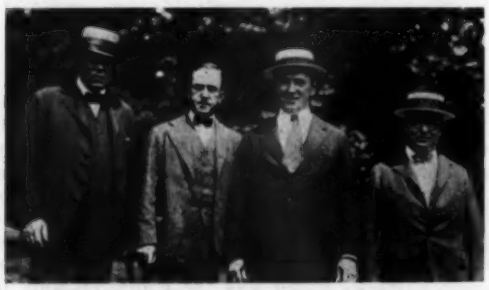
Upper Left — Sports at Charles Bank Playground, Boston, on Columbus Day

Upper Right — Tennis Court at Charles Bank Playground, Boston

Lower Right — Ronan Park Playground, Boston, Massachusetts, Showing the Baseball Field and Boston Harbor in the Distance

ternity. That is where the J. C. Coleman & Sons firm comes in.

As we have said before, Mr. D. E. Coleman is president of the well-known concern of J. C. Coleman & Sons of Boston. Very early in the game this far-sighted gentleman took a keen interest in this public-spirited movement. He foresaw what it would amount to as years went on, and as a result we find his name recurring with



Left to Right — J. B. Shea, Chairman of Park Commission, Myron D. Lewis, Commissioner, Mayor James M. Curley of Boston and Deputy Commissioner Wm. D. Long

remarkable frequency in any recent annual report of the Board of Park Commissioners under the items of expenditures on maintenance. Whether the job was for clearing away snow on the main drive on Commonwealth Avenue, resurfacing a bridle path, a thousand-dollar grading job or building oak seats on some baseball ground, it was to J. C. Coleman & Sons Company that the Board had learned to turn with entire confidence that the job would be done well and expeditiously.

But this is not all, Boston has been building new playgrounds with great regularity over the past few years. Such work has called for a surprisingly large amount of grading and heavy construction. In fact, within the past ten years this work has led to the removal of as much as 750,000 cubic yards of material. It will be noted that of this amount "Den" Coleman handled about 500,000 cubic yards and other work totalling in all as high as one million dollars.

Four of these jobs that will stand out as monuments to his ability are Ronan Park on Dorchester Bay, the beautiful Charlesbank Playground, located on the Cambridge side of the Charles River under the shadow of the West Boston Bridge, dedicated on Columbus Day, October 12, 1922, the Christopher Gibson Playground in South Boston, and finally the most recent, the Columbus Park Playground in South Boston.

Among other large park contracts handled by Mr. Coleman may be mentioned Mission Hill Playground, Tremont Street, Roxbury, costing $125,000; Christopher Lee Playground in South Boston, $45,000; and other small parks and playgrounds.

At the present time Mr. Coleman is starting work on the John J. Connelly Playground in Roxbury, which calls for excavation, filling and the erection of bleachers.

In addition to the park and playground work, J. C. Coleman & Sons has been identified with

some recent important construction work in the heart of Boston.

For example, he had one Bucyrus 20-B and an Erie B on the Insurance Building, a 15,000-yard excavation job on India and Broad Streets and recently finished a 10,000-yard contract near Eliot Square.

Jas. B. Shea, Boston Park Commissioner, and D. E. Coleman, Contractor, Boston

A 20-B Bucyrus was used on this contract, which was for a boosting station for the Edison Electric Illuminating Company where some very tough hardpan was encountered.

From the standpoint of earth moving the Columbus Park contract is the most interesting. This playground is at the head of Dorchester

The Crew on the Christopher Gibson Job; Ira Earles, Operator, and H. Cunningham, Fireman.

Bay in South Boston and forms a part of the strandway. Mr. Coleman's contract amounted to $450,000 and called for the excavation of about 275,000 cubic yards of material which included filling to the amount of about 162,500 cubic yards, about 107,000 cubic yards of sand and loam and grading of about 5,000 yards. All four of his shovels, two Bucyrus 20-B's and two Erie B's, were used on this work from time to time.

The Christopher Gibson Playground was completed in December last, costing $75,000. This work involved 50,000 cubic yards of excavation together with the erection of bleachers for a baseball park.

This description would not be complete without a word about His Honor, Mayor James M. Curley of Boston, who has ever shown himself as a whole-hearted sponsor of the Park System, and has taken a deep personal interest in the maintenance of the present parks and the development and construction of new units to this splendid system of which Boston is so deservedly proud.

The "Big Scene" in Cement Making

The climax in the huge impersonal drama of cement making is the burning of the raw materials in great rotary kilns.

One of the largest kilns, set on end, would be as tall as a 20-story building. A touring car could run through it.

The kilns are steel cylinders lined with fire brick. They rest at a slight angle from the horizontal on heavy rollers, and are driven by steel gears at half a revolution a minute. A medium-sized kiln with firebrick lining weighs over 600,000 pounds, and has foundations as heavy as for a 10-story building.

Into the upper end of the revolving kilns flow the finely ground materials for cement. There they meet a blast of burning pulverized coal, blown in at high pressure from an 8-inch jet at the opposite end.

Where the materials enter the kiln, the temperature is 1,000 degrees Fahrenheit or more. As they tumble over and over on their 3-hour journey through the kiln in the face of the flame, they rise gradually to a temperature of 2,500 to 3,000 degrees — more than is required for almost any other industrial process.

The workman, watching through his peephole in the end of the kiln, must wear smoked glasses. It is like looking at the sun.

And if you speak to him, you must shout close to his ear to be heard above the roar of the flames.

In a big cement plant, there will be a dozen or more of these kilns, roaring and revolving side by side in one great room.

A medium-sized kiln's output is 25 barrels an hour, and in that time, 3,500 pounds of coal must be blown into it.

You may have seen the great smoke stacks in rows over a cement plant. There is a stack for every kiln, and four kilns make a medium-sized plant, with 3,000 barrels capacity a day or thereabouts. When you see four of these stacks together, you can know that enough coal or equivalent fuel is being burned in the kilns beneath to supply the electricity for the homes, streets, shops and industries of three ordinary cities of 20,000 inhabitants each.

Burning cement, costly as it is, is only one of the heavy fuel consuming operations in cement making.

Every ton of cement you buy takes the equivalent of more than half a ton of coal in heat and power to make it — more than 200 pounds, that is, to the barrel of 376 pounds.

— Portland Cement Association

Bucyrus Class-24 dragline taking first cut from new river channel. This dragline crossed the Jackson River at this point. The Allegheny Division of the Chesapeake & Ohio to the extreme left with dump track in foreground and one of the fills in the center of the view.

A closer view of the Bucyrus Class-24 dragline taking first cut in new river channel. This machine has a 115-foot boom and a 3½-cubic-yard bucket.

Dragline Operations for Chesapeake & Ohio Railway Classification Yards at Clifton Forge, Virginia

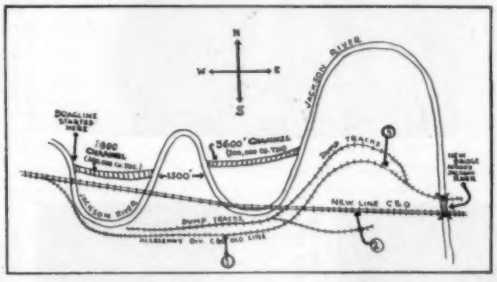
Chesapeake & Ohio Railway Classification Yards at Clifton Forge, Virginia

Brooks-Callaway Company of Atlanta Have Under Way a 2½-Million-Yard Contract Involving an Interesting River Change which Is Being Done by Dragline Excavator

IN the Allegheny Mountains in Western Virginia, within 30 miles of the West Virginia border, Clifton Forge, a city of some 6000 inhabitants, serves as the gateway for great quantities of ore and coal from the Virginian deposits. It is here that the Chesapeake & Ohio Railway have under way two years' work, involving new and extensive classification yards. The reduction of the curvature of the main line from 7 degrees to 4 degrees, the cutting of a new river channel and the construction of a 24-track concrete bridge 300 feet long. Incidentally, this is but one of several important improvements being made by the Chesapeake & Ohio on these lines in Virginia and West Virginia.

From the point of view of one interested in excavating methods, this piece of work is well worth attention. The contract involves upwards of 2,500,000 cubic yards and is in the hands of the Brooks-Callaway Company of Atlanta, Georgia.

All this work covers a distance of less than two miles. The sketch herewith will serve to give the reader a clearer conception of its general layout. It will be noted that the Jackson River meanders considerably down the valley. This meandering is being put to an end by the plans of C. W. Johns, chief engineer of the Chesapeake & Ohio. It will be noted that two of these loops are to be cut away by two new river channels 1800 and 3600 feet long, and the main line, whose course was more or less serpentine, will be straightened as shown.



Rough Sketch Showing Changes Under Way by Chesapeake & Ohio Railway at Clifton Forge, Virginia.

The Classification Yards

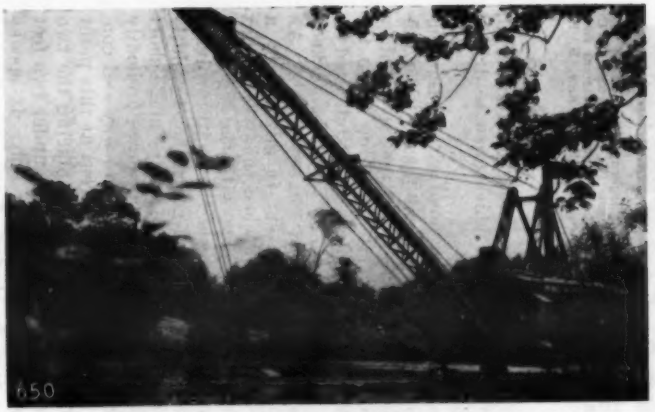
The main purpose of this work is, of course, the provision for adequate classification yards for the heavy traffic passing through Clifton Forge. These yards will have twenty 100-car tracks and receiving yards and ten 100-car tracks with a hump track and a car rider track in the center. The grading of these yards is in part heavy construction which calls for a 90-foot rock cut.

The River Change

The river change is the most interesting feature of this work. The Jackson River at this point is a mountain stream and has a rapid current, and is further subject to rapid rises from heavy rainfalls in the mountains. The material, furthermore, contains rock which must be drilled and blasted.

Resident engineer and staff of the Allegheny Division of the Chesapeake & Ohio. Left to right, top row: G. S. Maynard, J. C. Taylor, E. G. Rice, resident engineer; E. H. Adams, assistant resident engineer; J. B. Herring. Bottom row: F. C. Rice, E. H. Perry, C. B. Porter.

The excavation is being done with a Bucyrus Class-24 dragline excavator, equipped with a 115-foot boom and a 3½-yard bucket and mounted on trucks. In order to get the machine on to the work, the starting point of which is indicated on our sketch, it was necessary to cross the Jackson River, which in itself was no mean job. An approach to the river was cut in advance by a small revolving shovel, but when this was all but completed to the river's edge with the big dragline following close to its heels, the small revolving shovel stripped its propelling gears thereby blocking the big machine. But the dragline made short shift of this delay by picking the shovel up bodily and placing it to one side out of its way and continuing on its journey. The current at this point was very strong and the task of placing the two sets of rails for the heavy machine under two feet of racing water was a difficult one. It speaks well for the men in charge of the operation as



Crossing the Jackson River. The river is 150 feet wide at this point and the current is swift. The dragline is mounted on trucks.

Drilling operations in the wake of the dragline. This rock is blasted 7 to 8 feet and the rock removed by the dragline.

Taken at point shown as (2) in sketch. First lift for new main line cutting old country road. Three more lifts to come out.

Taken about at point shown as (3) in sketch. Taking off top of entire hill to make way for new yards. Material is a heavy black slag and gravel.

Taken at point shown as (1) in sketch, looking east. Dump in river to make bed for new main line. Present main line of Chesapeake & Ohio in foreground, note sharp curves. The dragline will cut channel through field at left of picture. When fill is completed old river bed will contain 1½ million yards.

well as for the flexibility of this truck design, that this crossing was accomplished with no further difficulties.

The dragline started operations at the point indicated on our sketch. In the first cut it removed the earth from the bedrock. This is shown clearly in two of our views. A fleet of drills followed the dragline preparing the bed rock for blasting. When this work was well under way a vicious cloudburst caused a rapid rise in the river, flooding the drills and delaying operations. The rock bottom of the channel is blasted to a depth of 7 to 8 feet and is then removed in a second cut by the dragline. The channel has a 100-foot bottom and 1 to 1 slope. The first channel is 1800 feet long, averages 25 feet in depth and contains upwards of 200,000 cubic yards of material. When this has been completed, the dragline will cross a 1500-foot bend in the river, making two more river crossings in its journey, and then tackle a 3600-foot cut of the channel which will involve the moving of approximately 300,000 cubic yards.

Dragline operations started on June 10 and are being pushed on a two ten-hour shift basis, the machine being equipped with an electric light plant for night work. For the 20 days of June, 50,000 cubic yards were handled. In July this was increased to 75,000 yards, and in August 70,000 yards. Owing to the fact that rock was encountered, the yardage figure was naturally decreased, it being 45,000 yards. It is expected that the October figure, however, will be between 60,000 and 70,000 yards.

The men responsible for this output are the operators M. A. Parr on the day shift and R. A. Green at night. W. S. Flint is the superintendent in charge with B. C. Gordon on the night shift.

Classification Yards and Realignment

An interesting fact concerning this particular operation is that within one month's time after bids were opened and the contracts awarded, the Brooks-Callaway Company had all preparations made and the first shovel was cut in. At the present time the Brooks-Callaway Company have four railroad type shovels and three small revolving shovels in operation. The first shovel was cut in on April 9th.

The work offered several knotty problems for the contractors to solve. The grading involved the cutting down of a sizeable hill where a heavy rock cut was encountered. Blasting operations here, however, were made difficult by the presence in the proximity of a hospital whose patients had to be considered in the freedom with which powder was used.

The heavy traffic over this division has made it necessary to lay out the work in such a manner that as little congestion is caused during operations as possible, consequently considerable dump trackage has been necessary.

The new bridge across the Jackson River is also being built under traffic. This will be about

Across — Climbing Up the Opposite Bank on a 15-degree Slope.

300 feet long and will provide room for 24 tracks. This work was sublet to Smith-Fowles & Company of Roanoke, Virginia, who by now have the work well under way.

The Chesapeake & Ohio Railway has turned over to the contractors large and commodious barracks which contain hot and cold showers and other conveniences.

This work is in charge of Messrs. B. E. & J. L. Brooks with R. M. Brooks as general superintendent. E. G. Rice is resident engineer for the Chesapeake & Ohio Railway.

Sandy was seen coming out of the First National bank by his friend, MacGregor, and he was accosted thus by him.

"Been putting in some money in the bank, hae ye', Sandy? I ken."

"Nae, nae, no putting money in," answered Sandy.

"Well, it cannot be that ye were taking any out," said MacGregor.

"Nae, nae. I was just in the place filling a fountain pen," answered Sandy.

Stop!

"Well! What are you stopping for?" asked the young man, as the taxi came to halt in the middle of the block.

"I heard the lady say 'STOP,'" said the taxi driver.

"Well, she wasn't talking to you, was she?"

The Brick Plant of W. G. Bush & Co. of Nashville

Description of a Well-Equipped, Modern Plant with a Weekly Capacity of 1,200,000 Brick, with Particular Reference to the Shovel Operation

WHEN Major W. G. Bush of Nashville, Tennessee, nearly sixty years ago, purchased fifteen acres on the northern suburbs of that city, on the banks of the Cumberland, near the historic course of the Nashville Blood-horse Association, and began to make brick from a clay deposit found there to be peculiarly adapted to that particular product, he laid the foundation of what has become one of the extensive plants of the sort in the whole United States.

From time to time material enlargements have been made to this plant, until at the present time the production has been increased by about fifty per cent. Previously, there was a production of 100,000 common and 25,000 facing brick a day; now it is 130,000 common and 70,000 facing brick. Additional kilns have been built and a complete new plant provided, devoted exclusively to the manufacture of facing brick. Continuous draft kilns are used instead of the beehive type on account of the greater fuel economy and much better quality of brick obtained. The company will average 1,200,000 brick weekly with the enlargements recently made.

Method of Securing Clay

A fine-textured clay for the manufacture of bricks is obtained from a pit in the river bottom land about three quarters of a mile from the mill.

A standard gauge railway leads from the mill to the pit. Due to the long haul involved and amount of material required, it has been found best to use a standard gauge instead of a narrow gauge system. The clay is hauled in special hopper bottom cars of five yards capacity, in order that the material may be dumped directly into the clay machine. Seven cars are used in a single train and are handled by a twenty-six-ton American saddle tank locomotive.

For some time the loading of the clay was very satisfactorily handled by a ⅝-yard shovel mounted on railroad wheels. However, in order to take care of the greatly increased capacity of the plant, a machine capable of handling nearly double the previous output was required. Consequently early this year a Bucyrus 30-B caterpillar-mounted shovel equipped with a 1½-yard dipper was installed. This machine has ample capacity to supply the plant when served with one train of cars. A train of seven five-yard cars has been loaded in ten minutes and the average time for loading is twelve minutes.

Being mounted on caterpillars, the shovel is quickly moved up and successfully operated over the muddy pit, except when pockets of quicksand are encountered. In this case, a few ties are placed under the caterpillars to give additional bearing.

The shovel crew consists of an operator and fireman. It is thus seen that the clay is loaded and transported to the mill by three men, including the dinkey engineer. A track gang is also used to maintain the clay track and other tracks about the plant. Daily requirement will average about 600 tons.

The Manufacturing Process

Tempering of the clay is done before loading. In dry weather the bank is kept properly moist by flooding with water from a pipe line.

30-B Bucyrus shovel loading clay for the W. G. Bush & Co. of Nashville, Tennessee. This shovel loads a train of seven 5-yard cars in ten minutes. Note the chain; one end of which is attached to the base of the shovel and the other to a tool box on skids. This is for the purpose of storing tools and furnishing locker for operator and helper.

The common brick and the facing brick are made in separate parts of the plant, but up to a certain point there is practically no difference between the two processes. The clay is brought in cars and dumped into hoppers which feed it into the augur machine where it is forced on the conveyor belt and cut into bricks. From here the bricks are loaded on to transfer cars and go to the drying kilns. The average temperature there is 150°. From the dryers the bricks are carried to the kilns for burning.

The facing brick requires different handling and is burned separately. It is harder and of a more pleasing color than the ordinary brick. Four types of facing brick are made: the hydraulic press, stiff mud, sand finish, and rough texture. In order to assure prompt delivery of finished bricks, a stock of several million is always kept on the yards.

In line with the progressive policy of the management of the W. G. Bush & Co., a well-equipped laboratory is maintained to investigate methods of maintaining and improving the standard of its product. In order to keep the mechanical equipment in the best shape, a well-supplied repair shop is also provided. The plant operation and all experimental work is under the able direction of Mr. Harvey Herbert, who besides being a trained engineer is a practical brick manufacturer of many years' experience.

The present officers of the W. G. Bush & Co. are: T. L. Herbert, Jr., President; W. B. Herbert, Vice-President; and Robert Herbert, Treasurer. The building material supply firm of T. L. Herbert & Sons of Nashville, Tennessee, is also owned and operated by the same interest. The Herbert-Fischer Brick Co. of Memphis, Tennessee, is principally owned and operated by the Herbert interest of Nashville, Tennessee, and the Fischer Lime & Cement Co. interest of Memphis, Tennessee. The Herbert-Fischer Brick Co. also operates a Bucyrus caterpillar tractor shovel.

These gentlemen are all grandsons of the original founder and under their progressive management the plants are being steadily enlarged to meet the increasing demand for their products.

Storage Yards of W. G. Bush & Co. with Plant in Background

Note the muddy bottom. This caterpillar-mounted shovel has no difficulty in moving about the pit, despite the pockets of quicksand encountered. A few ties thrown under the caterpillars provide sufficient bearing.

Using a Dragline Excavator as a Pile-Driver

Another Example of the Versatility of This Machine for Dam Construction

DURING the period of construction operations on the Miami Conservancy District, engineers frequently had occasion to demonstrate the great versatility of the dragline excavator.

The Excavating Engineer published a large number of articles during this period, describing interesting and novel application of this extremely flexible machine.

In the *Engineering News-Record* for May 24, 1923, C. H. Eiffert, Maintenance Engineer of the Miami Conservancy District at Dayton, Ohio, describes in some detail the building of a retaining dam across the Great Miami River at Hamilton. The principal feature of interest in connection with the actual construction of this dam was the use of a dragline excavator mounted on caterpillars for the excavation work, the building of the cofferdam and the driving of the piling in connection therewith. We believe this performance is of sufficient interest to warrant describing the method of pile-driving and equipment used in more detail than was given therein.

The dam in question was of concrete structure of the overflow type, 801 feet in length between abutments, and 5 to 9 feet in height above the stream bed.

It was built across the river at the upstream end of the river improvement at that point, in order to prevent the drift of gravel into the improved channel.

The dam rests on a porous foundation of well-graded gravel and has continuous cut-off wall of steel stud piling 8 to 12 feet in depth at the upstream end.

Dragline Operations

The dragline, which was a Class-14 Bucyrus, was mounted on caterpillars, with a 70-foot boom and a 1½-cubic-yard bucket. It started work at the east end and worked forward to the middle of the dam. Meanwhile the river was still flowing in its low water channel to the west of the cofferdam.

The excavation was kept free from water by means of an 8-inch electrically driven centrifugal pump, running about half time.

When this work was completed, the dragline was used on other work of the District while the east half of the dam was concreted. Five 24-foot openings were left, through which the stream was to be diverted.

The dragline was then brought back and proceeded to remove the cofferdam, diverting the stream through the openings mentioned above. These openings were later filled in. It then proceeded with the excavation and driving the piling for the west half of the dam until its completion.

Our photograph shows the east half of the dam completed with the dragline driving the stud sheeting in the west half. The toe piles are shown already in place.

The Dragline as a Pile-Driver

The method of driving the piles was similar to that used in connection with the construction of the Black Street Bridge at Hamilton, described in *The Excavating Engineer* for December, 1920 and May, 1921. The performance again demon-

Class-14 Bucyrus dragline excavator equipped with pile-driving leaders, driving sheet piling in the west half of the dam at Hamilton, Ohio. Note that the toe piles are already in place. This dragline drove 52 piles to an average penetration of 18 feet in one ten-hour shift. The electric pump for keeping excavation clear of water is shown in operation. The east half of the dam is completed, note 24-foot temporary gaps to accommodate the flow of the stream during construction operations. Gravel and mixing plants may be seen in the background.

strated the all-around usefulness of the dragline excavator. The bucket was removed and the pile-driver leaders hung from the end of the boom by means of cable lashings, thus converting the machine into a caterpillar-mounted pile-driver. Steam for the hammer was supplied from the dragline boiler. The pile-driver hammer was attached to the lower cable of the dragline so that it could be easily raised and lowered in the leaders. The boom hoist was used in lifting the leaders and placing them in position for driving the piles. The dragline was run through a pulley suspended at the end of the boom, as may be seen in our view and was used for handling piles.

The method of operation followed was to spot the leaders over the pile to be driven and then lower the boom thus bringing the weight thereof on the leaders, causing them to sink about two feet into the gravel.

Held by the boom at the top and the gravel below, no guy wires were necessary for steadying purposes, which made possible the saving of considerable time in the driving of a pile.

52 piles were driven 18 feet in 10 hours with this equipment. The dragline swung, spotted and drove home with an average penetration into the gravel of eighteen feet, 52 piles in one ten-hour shift. As any contractor who is familiar with this work will testify, this is an excellent performance under the best of conditions.

Pueblo Flood Protection

Progress of the Pueblo Conservancy District, providing flood protection for Pueblo, Colorado, has reached a stage indicating that bids for the work can be received some time during December. The work will be formally advertised in November or December. It involves the construction of a new river channel to carry 125,000 cfs of water, 34 miles of railroad tracks, and a barrier dam 35 feet high and 3060 feet long. The plan has been officially approved and benefits appraised, upon which the assessments will be levied. The total estimated cost of the project, including land and administration, is $4,000,000. The project was described in the *Engineering News-Record* of July 12, 1923.

The work has been divided into 48 contract units. A contractor may bid on any single unit or any combination of units. He may thus confine his interest to such work as is best suited to his equipment and organization. The work is listed below in a few general classification groups. Each item may be considered a separate contract unit unless otherwise indicated.

Excavation and Grading

1,000,000 cubic yards, as a single contract, excavated from dry cut to form new channel, suitable for one plant consisting of trains and steam shovels or draglines, divided as follows: 160,000 cubic yards shale from side hill, placed in railroad fill before September, 1925, and 50,000 cubic yards from bottom, placed between September, 1925, and May, 1926; 180,000 cubic yards earth placed in railroad fill before September, 1925, and 130,000 cubic yards between September, 1925, and March, 1926; and 261,000 cubic yards earth placed in levees before September, 1925, and 220,000 cubic yards between September, 1925, and May, 1926. The above excavation will be dry except for possibly a small amount of seepage water, which may be drained by gravity, and the average train haul will be about 0.7 miles.

54,000 cubic yards earth excavation from channel, suitable for small dragline and team haul.

140,000 cubic yards in miscellaneous small levees built from side borrow, suitable for small dragline or teams, divided into contract units of the following quantities: 6,000, 50,000, 70,000 and 14,000 cubic yards, placed previous to September, 1925.

170,000 cubic yards of railway embankment from side borrow, suitable for dragline or teams, placed before September, 1925.

281,000 cubic yards rolled fill embankment in dam, 6 miles west of Pueblo, haul 1,000 feet, suitable for elevating grader and teams, placed before September, 1925.

Concrete

Levee and Channel Slope Paving, 10 inches thick, 96,000 square yards, extending 13,000 feet in length, half placed before September, 1925, and half between September, 1925, and May, 1926. 20% is below ground water line, but can be drained by gravity.

Headgate structure, 660 cubic yards reinforced concrete, including 870 feet of 48-inch concrete pipe, built during September and October, 1925.

Retaining Wall, 1,400 cubic yards concrete, built before September, 1925.

Culverts as follows: Two — 8 x 10 x 130 feet — built before July, 1925; and three — 12 x 10 x 100 feet — built early in 1926, each culvert being a contract unit.

Concrete Through Girder Bridge, 3-track, 200 feet long, 4,200 cubic yards reinforced concrete, complete by July, 1925.

Bridge Substructures, (a) for a 400-foot, double-track, 4-span through railroad bridge, 2,000 cubic yards before March, 1926; (b) for a highway bridge and viaduct, 1,300 cubic yards before March, 1926; (c) for a street bridge, 1,600 cubic yards before March, 1926; (d) for a street bridge, 2,000 cubic yards before March, 1926; (e) for a 400-foot, double-track, 2-span railroad bridge, 3,000 cubic yards before September, 1925; (f) for a highway bridge, one 280-foot span, 660 cubic yards before September, 1925, each lettered item being a contract unit.

Dam, 6 miles west of Pueblo, including spillway of plain concrete 4,900 cubic yards, wing walls of plain concrete 660 cubic yards, railroad conduit of reinforced concrete 1,600 cubic yards, ditch culvert of reinforced concrete 100 cubic yards, before September, 1925.

Steel Bridge Superstructures

(a) One 400-foot, double-track, through railroad bridge, consisting of 4 riveted spans, 1,750,000 pounds, wanted before September, 1925; (b) Reconstructing 800,000 pounds of existing spans and supplying 360,000 pounds of new viaduct steel spans, wanted before May, 1926; (c) Reconstructing one 150-foot span, weighing 732,000 pounds, and supplying one 104-foot span, weighing 375,000 pounds, wanted before May, 1926; (d) Reconstructing one 120-foot span of 200,000 pounds and supplying one 136-foot span of 365,000 pounds, wanted before May, 1926; (e) One 400-foot, double-track, through pin-connected railroad bridge consisting of 2 skew spans, 2,500,000 pounds, wanted before November, 1925; (f) One 280-foot through pin-connected steel highway span, 480,000 pounds, wanted before November, 1925, each lettered item being a contract unit.

Track Laying and Ballasting

35 miles of standard gauge railroad track, 130 switches and 8 crossings, also furnishing all material except rail and angle bars, wanted between July, 1925, and May, 1926.

Removal of Tracks and Storage of Material

35 miles of present main line and yard tracks, to be removed between July, 1925, and May, 1926.

Steel Sheet Piling

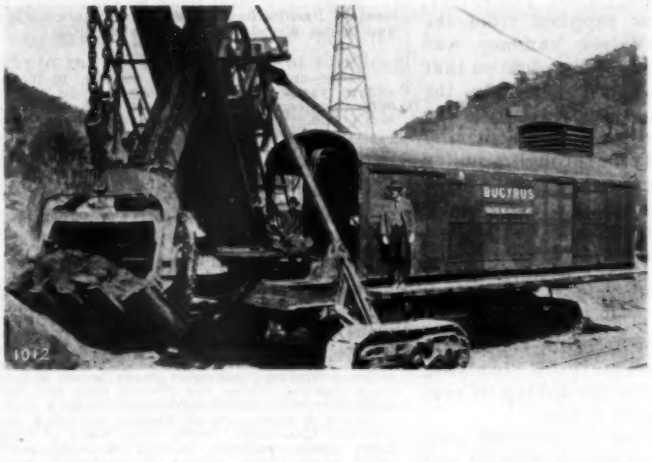
One row 13,600 feet long of ⅝-inch interlocking steel sheet piling, in lengths 6 to 14 feet, total 74,400 square feet, half before September, 1925, and the remainder before May, 1926.

Sewers

5,000 feet of 12, 15 and 21-inch vitrified tile sewer, to be completed by September, 1925.

In addition to the foregoing work for which the first and principal contracts can be let, there will be certain work deferred for construction during the later stages. This will include a reinforced concrete underpass containing 2,000 cubic yards; a temporary pile bridge; right-of-way fences; and railroad buildings as follows: Local freight house, ice house, small office buildings, wheel house, coal chute, ash pits, and three stalls added to engine house, etc.

Information for bidders is being prepared for distribution at the earliest possible date. Those interested may obtain additional information by communicating with the Pueblo Conservancy District, Pueblo, Colorado, or the Dayton Morgan Engineering Company, Chief Engineer, Pueblo, Colorado, or Dayton, Ohio.



The three photographs above show ...ustra... The Kandos Cement Company of ...New... shows the power house in the rear. Th... the fuel is obtained from the pl...own... Wales Government Railroad is in ...grou... illustrate this company's new Bu...C el... pillars. It is here shown in develo...work... the quarry.

6-yard, 16" x 18", Bucyrus dipper dredge owned by the Home Department of the Japanese Government engaged in extending Yokohama Harbor a short time before the earthquake. The purpose of this work was to increase the depth of the harbor in the shallowest part for purpose of constructing docks. The material was very hard clay. Elevator dredges with open-connected buckets had been previously used and were unable to handle the material successfully, principally due to the fact that the character of the material prevented the successful operation of rock breakers. This dipper dredge nearly cut in two the average cost of doing this work. A survivor of the earthquake has advised us that the dredge went through this catastrophe unharmed and undoubtedly has before it a tremendous program.

The Indian Government has ...an e... canals in the Punjab. This ...ows ... excavator at the Sutley Valley ...ion ... gation District, at Ferozepore. ...Two... are also engaged on this work.

This photograph shows the ...cyrus... 40-foot boom and a ¾-yard ...gage... for the construction of a ter...ation ... Imperial Japanese Governmen...ys.

ustralia's most modern cement plants, New South Wales. The center view The mouth of the coal mine where own by a cross. The New South ground. The other two photographs C electric shovel mounted on cater- ork previous to its actual service in

an extensive system of irrigating a Class-24 Bucyrus dragline on Project of the Punjab Irri- Two Class-14 Bucyrus draglines

This dragline is also the property of the Home Department of the Japanese Government. It is a new Bucyrus 50-B dragline with a 45-foot boom and a 10-foot extension and is equipped with a 1-yard bucket. It is shown digging a new diversion channel for river flood prevention in the vicinity of Tokio.

yrus dragline equipped with a aged in preliminary excavation ation at Nagoya, Japan, for the

The Excavating Engineer

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Navy Day — Saturday, October 27th

Not so many weeks ago, when the newspapers of our country were filled with accounts of the terrible disaster that had befallen Tokyo and Yokohama, we read with a swelling of pride how the United States Navy was first on the scene of action, as a representative of humanity; how a destroyer with the stars and stripes at the stern had the glorious courage to run through forbidden and dangerous waters, through channels that no longer were channels, to rescue refugees from burning Tokyo; how the American admiral without even waiting for orders requisitioned shiploads of supplies for those same suffering Japanese whom many had termed our potential enemies.

Such is the United States Navy, and yet mistaken sentiment and misinformation in our country has made it necessary to set aside one day in the year as Navy Day, in order to bring home to our people its value and true purpose.

Americans are a peace-loving people. They are inclined to denounce our Army and our Navy as symbols of war. But many fail to recognize the fact that a navy is a virtual necessity, if we are to insure respect for our voice in the councils of nations, to stand guard over our people in all corners of the globe or to insure fair play to our merchant ships in foreign waters.

We live in a world of realities, not dreams. If we are ever to come to a time when battle flags can be furled, armies and navies scrapped and all danger of wars and revolutions cast to the four winds, that time will come by slow and steady evolution in which America will, as it has in the past, taken a glorious lead.

In the recent disarmament conference America led the way. Some progress was made, but we cannot afford to believe in limitation of armaments by solitary example.

We are permitted by common consent among the great nations of the world to a certain naval strength. It, therefore, becomes our duty to see that the strength that is left to us be kept at the highest possible efficiency.

The day when battle flags can be furled has not dawned — the ferment in Europe today is a striking example of this. It is idle and foolhardy to blind ourselves to this truth, and knock or allow our representatives in Congress to knock any attempts on the part of the patriots of our nation to make what we have a bulwark against any enemy that might rise against us and a strong arm of protection to our people who are far from our shores.

A modern, efficient navy is a nation's insurance. Let us look back at history for a moment. Who of us has not swelled with pride in reading how our Navy brought the greatest nation on earth to terms in 1776 and 1812 when we were but a collection of colonies. Then remember the splendid exploits of 1898 when victory without a navy would have been a virtual impossibility, and who of us here will not recall the vital service of the Navy to all humanity during the World War when over 2,000,000 of our men were convoyed across the submarine-ridden ocean without the loss of a single life.

So it is in every crisis of our history. But history does not record in such blazing letters the Navy's service to our citizens in danger in foreign lands, where the silent presence of a warship flying the stars and stripes, has brought to summary terms those who would do them harm. Nor does it publish to the world such things as are going on today in Japan or in Smyrna where thousands of refugees owed their lives to a destroyer with our flag flying at the stern.

The Navy will continue to serve us so in years to come, provided we as a nation appreciate its true value.

The American Navy never caused a war and it is safe to say it never will. It has been a potent factor throughout its history in preserving peace and bringing succor to those who need succor.

No Interruption

"But suppose," said one of the spectators at the airdome, "that the parachute should fail to open after you jumped—what then?"

"That wouldn't stop me," answered the parachutist. "I'd come right down."

"Are you the plumber?" asked Mrs. Cooke.

"Yes, ma'am. I'm the plumber, all right."

"Well," she replied, "I just want to caution you to exercise care when doing your work. All my floors are highly polished and in perfect condition."

"Oh, don't worry about me slippin', lady, I've got nails in my shoes."

· FIELD NOTES ·

How to Pick Motor Truck Drivers

By P. L. Sniffin

The responsibility placed upon the motor truck driver is too frequently under-estimated. He is solely responsible for the efficient operation and care of a vehicle that represents a large investment. He is the truck owner's representative in the field, and creates an impression among the general public one way or another which is reflected directly to the business. He is legally the truck owner's agent, and for his acts the owner himself is held responsible, as in the case of accidents and violations of traffic ordinances. He may, through diligence, enable his truck to accomplish a large amount of work in a given time, or through an attitude of indifference or laziness cause a high unit hauling cost which will sink deeply into the profits of the business.

The selection of drivers is of even greater importance than the selection of the vehicles themselves. A poor vehicle in the hands of a competent driver is a far better combination than a good vehicle in the hands of a poor driver. Yet, above all, the chief reason for using care in employing drivers lies in the elimination as far as possible of "turnover." It is not only inconvenient but highly expensive to drop one man from the payroll and hire another at frequent intervals. "Breaking in" a new man requires patience that is costly, and obviously too much of this will cause extra wear on the motor vehicles and a higher operating cost.

Primarily, the applicant should be well physically, since a good constitution is necessary for such outdoor work. A nervous, impatient, or high-strung individual is apt to take his temperament out on his truck. Since a sense of responsibility is necessary, most experienced employers give preference to married men.

The more desirable characteristics are caution, dependability and judgment, the qualities which come with age or a more settled position in life. For work of this kind it is generally considered that the dash and vigor of youth are not only unnecessary but quite often are undesirable. It is well to inquire as to the applicant's personal habits and always to look up references and investigate previous employments. If the applicant has had a part in any accidents, these should be investigated as well as the conditions surrounding them.

It is well to consider the following advice from an authority on the subject of driver selection:

"Better results come from training sober, cool-headed, reliable men — possibly teamsters — than from employing mechanical experts of proved ability to take taxicabs around corners on two wheels and to weave through crowded traffic at a breakneck speed. The taste for speed is easier to acquire than to relinquish — and in a motor truck it is not only dangerous but it is an agent of destruction.

"Lack of interest and loyalty is the commonest complaint against truck operators. They fail to keep the truck in good condition, because it makes no difference to them whether it runs or stands in the garage. And a truck that is unduly expensive to operate takes no more from their pockets than one that costs almost nothing in repairs or supplies.

"This is a problem that must be faced and solved by each individual truck owner; some have done it by a system of merits and demerits — reward and punishment for things done or left undone. Others have done it by offering prizes and bonuses to drivers whose cost records reflect intelligent care and attention to the truck itself.

"But whatever plan of remuneration you adopt, and whatever steps you take to insure the driver's interest in the firm, the first essential will be the selection of the driver himself. Don't make the mistake of thinking that any man who can handle a steering wheel is fit to be trusted with your truck investment. Not only may he ruin the truck, but you will be held accountable for any damage to another machine or to persons."

Use Dynamite Cleaning Out Old Channel

The difficulties of opening up an old channel which had become filled in with logs, stumps and tangles of weeds and underbrush were solved recently in a rather impressive fashion at Lubdell Lake, near Pontiac, Michigan, by the use of dynamite. The channel ran around a small island near the shore of the lake, and was a natural waterway, but in the course of years it had become too clogged to permit it to be used. The place is being developed as a summer resort, and it was thought advisable to put the channel in such condition that it could be used by canoes and other small craft. Because of the topography of the land on either side of the channel, consisting of timbered hills, it was considered almost impossible to do the work by either dredge or hand.

N. A. Kessler and A. J. McAdams of the Michigan Agricultural College and J. C. Donnelly of the duPont Company were called in as experts to do the work of blasting the channel out with dynamite.

They loaded about 1,000 feet of the ditch in two hours, placing the charges in three lines, each line spaced about 48 inches from the others. The charges in each line were placed 20 inches apart. In the center line they loaded one-pound cartridges in each hole, and on the outside lines one-half-pound cartridges in each hole. At two spots in the ditch, they encountered almost clear water, and in this they loaded only enough dynamite to carry the propagation, for it was determined to shoot the ditch by the propagation method, in which the detonation of one cartridge explodes all the others.

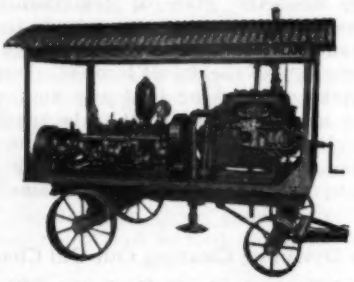
The result was an impressive blast which was witnessed by several hundred persons. The debris and mud in the route of the channel were scattered over a large area, doing away entirely with any spoil banks which might have washed back after a few rains.

After the blast it was found that a very good channel twenty (20) feet wide and about four feet deep had been obtained.

DEVICES YOU OUGHT TO KNOW ABOUT

The Barnes Triplex and Quadruplex Pumping Plants

Every experienced paving contractor knows the necessity and value of a pumping plant that will stand up under continuous service and deliver an unfailing water supply on concrete road construction. A pumping outfit must be designed and constructed to withstand the severest service to which it is put. All parts of the unit must be far stronger than on a pump built for 150 pounds pressure when an average of 250 pounds pressure is generally used for road construction. Frequently such a pump is called upon to work against as much as 500 pounds.



The Barnes Quadruplex Pumping Plant Built for a Maximum Working Pressure of 500 Pounds

The Barnes Manufacturing Co., Mansfield, Ohio, has designed and constructed a pumping plant which will meet with these varying conditions. We publish herewith photographs of the Barnes Triplex and Quadruplex Roadbuilder pumping plants. These pumps combine the necessary qualities of a big volume of water at a high pressure. In addition to supplying water for the big paver, the larger plants will sprinkle the subgrade; flood the concrete in curing; in fact supply more than enough water to keep the job going full speed ahead and assure the profit figured in the bid.

Accessibility in a road-builder's pump is a necessity not a talking point. Any part of this pump may be removed for inspection or repair in less than five minutes without dismantling the pump. Remove the cylinder head and the entire interior is accessible. This is impossible with a vertical pump. The plungers may be repacked in half an hour or less reducing repair time to a minimum. The brass wing type valves rest on tapered brass seats and may be lifted out by hand.

The three-throw, 120-degree crankshaft is of extra tough steel. The cylinders are cast en bloc. The projectile-shaped plungers are turned and finished to a hair breadth, supported on guides adjustable for taking up wear. The malleable iron I-beam section connecting rods are insurance against breakage from shock. The gear and pinion are "stub tooth" machine cut, 100% stronger than the ordinary gear. The gear is bolted, not keyseated, to the crankshaft. On a high-duty pumping plant, this is extremely important. The Barnes Triplex and Quadruplex Outside Packed Plunger Pumps are built for a maximum working pressure of 500 pounds — the highest pressure pump built for road-building water supply. Every pump is tested at considerably higher pressure before leaving the factory.

The Barnes Triplex Road-Builder's Pumping Plant

A large, slow-speed, heavy-duty pump, when

operating at a high pressure, will stand up far better than a smaller one running at a higher speed, particularly on a road job. Experience shows that a road-builder's pump should not have a greater speed than 60 r. p. m. This company has, therefore, built large pumps, running at a moderate speed, instead of a small pump running at a high speed.

In addition to these features, Barnes Pumping Plants are equipped with a clutch to disengage the pump from the engine when starting and for allowing the engine to idle while making adjustments.

On account of the higher pressure of outfits "34" and particularly "34A" 2-inch pipe can be used for pumping five miles, where 2½-inch pipe would be required with a lower pressure outfit. Add to the saving in cost of 2-inch pipe, the additional cost of handling and freight on the larger pipe and the higher pressure outfit is by far the better investment.

Again, pipe is usually replaced every three years, and the life of a Barnes Pumping Plant with care is, at least, five years; every time the pipe is replaced, the original saving is repeated.

The Barnes Manufacturing Co. has recently published their Bulletin No. 106 which describes more fully the many uses to which these pumping plants may be put. This booklet may be obtained by writing to the Barnes Manufacturing Co., Mansfield, Ohio. Use the postal enclosed with this issue.

SHOTS FROM THE FIRING LINE

Central States Notes

BY M. J. WOODHULL AND MARK GAYLORD

The Indiana Association of County Commissioners held their annual convention in Evansville the last week in September. At the business meeting Fort Wayne was chosen as the meeting place for next year and Commissioner Shelby McDowell of Evansville was elected president.

Martin & Hart are getting a good start on their highway job at Leavenworth, Indiana. As usual they found their 20-B to be a much larger shovel than it appears to be from the outside. Former erector Rose is running for them.

W. L. Callis of the Hopkins County Construction Co. has their new 30-B at Smithland, Kentucky, and reports they are more than pleased with it.

A. Guthrie & Co. have recently added a 70-C Bucyrus to their string of Marions on their Illinois Central work near Madisonville, Kentucky. Work is progressing in spite of almost continuous rain.

New York

Our staff correspondent at Millville, New Jersey, wires that Harry Stang, now foreman for Charles Pettinos Company at Millville, having graduated from a shovel, is quite capable of directing Tom Jobes and John Rign.

Northwestern States Notes

BY A. B. HANCE, PORTLAND, OREGON

Mr. W. J. Hall, Idaho State Commissioner of Public Works, recently signed a project statement to be filed with the United States Bureau of Public Roads, for the construction of 11 miles of paving between the city limits of Pocatello and Fort Hall. The work will cost approximately $221,000, more than three-fourths of this amount to be paid through the federal government. Construction will involve the movement of 45,000 cubic yards of earth and the laying of 68,640 square yards of pavement, either concrete or bituminous. Bids have not been asked for.

The State Department of Public Works, Idaho, will soon call for construction bids for a road between Harpster and Stites, a bond issue of $35,000 being voted some years ago by the Clearwater Highway District for the purpose, in co-operation with the state.

Bids were opened at Missoula, Montana, on the 21st of September, for the construction of approximately 5.43 miles of road, located midway between Troy and Noxon. The road is located near the Montana-Idaho line, southwest of Libby. The work consists of clearing 23 acres of land, grubbing 20 acres, excavation of 24,750 cubic yards of dirt, finishing 5.43 miles of dirt road, putting in 750 lineal feet of pipe culvert and 40 lineal feet of cedar log culverts, putting 4,250 cubic yards of screening surface in place and the use of 500 cubic yards of maintenance rock.

The following bids were received by the U. S. Reclamation Service at Klamath Falls on September 12th for construction of the Gerber dam, requiring approximately 10,000 cubic yards of excavation, 1,300 cubic yards of fill, 1,400 lineal feet of grout holes, 8,500 feet of concrete; W. D. Miller, Klamath Falls, $150,480; Morrison-Knudsen Co., Boise, $179,755; Dunn & Baker, Klamath Falls, $218,910; A. Guthrie & Co., Portland, $193,500.

Estimates submitted by the Alaskan Road Commission to the War Department, and approved by it, call for $1,600,000 for the annual Alaska appropriation next year for roads and trails in the territory. The Commission's figures have been submitted to the Bureau of Budgets with the regular annual estimates of the department.

The Washington State Highway Commission opened bids at Olympia on the 6th of November for the following contracts: Northbank Highway, between Greer Creek and Wind River, Skammania County, grading and graveling 2.3 miles; Pend Oreille Highway, Jared to Blueslide, Pend Oreille County, grading and surfacing with crushed rock or gravel, 6.7 miles; Inland Empire Highway, between Walula and Burbank, Walla Walla County, grading and graveling, 11.7 miles; North Central Highway, from Odessa west, Lincoln County, grading and surfacing with gravel and crushed rock, 12.2 miles; Permanent Highway No. 9, from Anacortes east, in

Skagit County, grading and graveling, 2.0 miles, appropriation to be matched by equal amount of county funds; Anatone-Asotin Highway in Asotin County, special appropriation for road making and extension from the state highway, grading 4 miles.

The Bureau of Public Roads, Montana, received the following bids on the Nyack-Crystal Creek Section of the Belton-Java Highway project. The Siems-Carlson Co., low bidders at $125,444.48, received the contract for the 3.63 miles of road. This portion of the Belton-Java Highway project, it is said, will be particularly difficult to construct. The route follows the railroad line of rough mountainous territory, and extreme care must be used at places to prevent boulders from falling upon the tracks of the Great Northern railroad. The road at several points will be above the level of the tracks. The bids submitted were: Siems-Carlson Co., Spokane, $125,444.88; Moore & Anderson, Tacoma, $138,718.90; A. L. Markus, Missoula, $158,679.10; Stephens Bros., St. Paul, $159,959.45; Pioneer Construction Co., Bozeman, $161,289.84.

Contract for the grading of the new highway between Seattle and Everett and for the highway across the flat between Everett and Marysville will be let next March, according to a letter received from James Allen, Washington State Highway Engineer. Tenders for the grading for the San Juan extension of the Pacific Highway from Anacortes eastward to meet the main truck road will be called for at once by the State Board. It is thought that the contract for this portion of the work will be let this month.

Siems & Carlson, Spokane highway builders, were awarded the contract by the government for the construction of four miles of highway at Sitka, Alaska, at a cost of approxmiately $125,000.

The National Forest Service on October 3rd awarded contract for a seven-mile extension of the Lewis and Clark Highway. Six miles, placed under contract some time ago, will be completed in a few days. This latter work gives the highway a completed distance of 31 miles east of Kooskia.

Work is being pushed on the uncompleted 23 miles of state highway between Riggins and Round Valley on the North and South Highway. The work is being done by the Idaho State Highway Board at a cost of $20,000.

Bids will be opened on October 15th at Lewiston, Idaho, on a section of the North and South Highway in Latah County, known as Federal Aid Project No. 74. This section is 5.91 miles in length between Potlatch and Harvard, and consists of grading and surfacing with crushed rock at an estimated cost of $80,000.

Assurance was received at Grants Pass on the 8th of October that the Oregon State Highway Commission intends to complete the Oregon part of the highway. A telegram from the Commission stated that $100,000 had been set aside to build the five-mile stretch from the O'Brian schoolhouse to the state line, to connect with the road now being constructed on the California side by the federal government and the state of California.

On the 15th of October, the government will advertise for bids on seven miles of rock excavation on the Detroit-Niagard Road, Santiam River, near Mill City. There is approximately 100,000 yards of heavy rock excavation on this section and it will be good winter work.

The Oregon State Highway Commission will open bids at Portland on the 15th of this month for the following work: Stices' Gulch Section of the Baker-Unity Highway, 6.2 miles of grading involving approximately 123,000 cubic yards of excavation, in Baker County; Deschutes County, Unit No. 1 of the Paulina Prairie-Lava Butte Section of the Dalles-California Highway, 7.7 miles of grading involving approximately 100,000 cubic yards of excavation.

Pacific Coast Notes

BY P. H. BIRCKHEAD, SAN FRANCISCO, CALIFORNIA

Contract has been awarded to San Francisco Bridge Co., Nevada Bank Building, San Francisco, who bid $.1344 per cubic yard, total $94,080 for 700,000 cubic yards dredging at Berth No. 230 for Board of Harbor Commissioners, City of Los Angeles.

Contract has been awarded to Bates & Borland, Oakland Bank of Savings Building, Oakland, for the construction of a tunnel to be 4 miles in length and 19 feet in diameter after it is concrete lined at Pit No. 3, Shasta County, for the Pacific Gas & Electric Co., San Francisco.

Contract has been awarded to Olympian Dredging Co., 149 First Street, San Francisco, who bid $0.0993 per cubic yard for about 323,000 cubic yards clamshell and team earthwork, 42,000 cubic yards suction dredging work, at $.50 per yard.

The proposition of holding a bond election to vote on issuing bonds in amount of $550,000 has been approved by the Board of Directors of the South San Joaquin Irrigation District, at Manteca. The proceeds from the sale of bonds would be used to finance the lining of canals and ditches with concrete and the installation of pumping plants. About 50 miles of canals will be relined. Between 10 and 20 pumps of the vertical turbine type, 6-inch and 8-inch diameter, will be installed.

Contract awarded to Southwest Paving Co., Washington Building, Los Angeles, who bid $460,000 for 21.1 miles of highway from Palmdale to Pallette Creek.

The first car of ore from the property of the Columbia Steel Corporation, at Iron Springs, Utah, was shipped September 25. The company is completing its No. 1 tunnel, which is to be the main outlet for the ore. Shafts are being sunk on the ore body in a number of places, and smaller tunnels are being driven to connect with the main tunnel. After continuous shipments are under way it is expected to store the ore at Ironton (near Provo, Utah), the site of the new blast furnace and coke ovens under construction.

City Council of Fresno, Wm. Stranahan, City Engineer, has voted $20,000 appropriation to finance city's share of the cost for a flood and sewer farm water drainage ditch from sewer farm to Fresno Slough. Fresno Irrigation District will pay $30,000 as its share of the cost.

A report has been prepared by the Orange County Board of Harbor Commissioners recommending the following extensions and betterments to the Newport Harbor. It is proposed to hold a bond election soon to vote on issuing bonds in amount of $940,000 to finance this work, as follows: East Jetty, to be deepened to 30 feet of water, $400,000; West Jetty, extension of, and reinforcement, $195,000; Entrance, to be dredged to depth of 30 feet, $135,000; construction of a belt line railroad, $50,000; Wharves and warehouses, $75,000; Engineering, etc., $85,000.

A franchise has been granted to the Pacific Electric Railway Co., Pacific Electric Building, Los Angeles, and condemnation proceedings are now under way for the proposed construction of a subway from Hill Street, between 4th and 5th, to Glendale Boulevard, etc. Cost of rights-of-way is $834,647. Tunnel is to be constructed shortly.

Preliminary plans are being completed by Consulting Engineer A. D. Schindler, Balfour Building, San Francisco, and will be presented to the State Engineering Department about October 16th for approval, for the construction of an irrigation, reclamation and drainage system for the Tulare Lake District, known as Reclamation District No. 825, in Kings County. It is proposed to construct levees, canals, ditches, etc. Many large pumping plants will be installed in the District as needed. The District, when all construction work is completed, will include about 170,000 acres of land, reclaimed and irrigated. Some of the land is already under irrigation. Total estimated cost of work remaining to be constructed is about $3,500,000. A bond election to vote on issuing bonds in this amount will probably be held in the District as soon as the plans are approved by the State Engineering Department and Bonding Commission. A. D. Schindler, Balfour Building, San Francisco, is Consulting Engineer.

An appropriation of $50,000 has been made by the Los Angeles County Supervisors to finance a preliminary investigation of the proposed San Gabriel Flood Control project. It is proposed to construct a dam 425 feet in height, the largest in the world, in the San Gabriel Canyon. The dam would be about 1,800 feet long on top, 420 feet thick, and would require 2,000,000 cubic yards concrete. About twenty balanced valves would be installed of 1,000 sectional feet capacity each. A variable head power plant would also be constructed, just below the dam. Total estimated cost $20,000,000. It is probable that a smaller dam than the above will be constructed as a first unit, to be added to later until the dam is of the above dimensions. J. W. Reagan is Chief Engineer of the Los Angeles Flood Control District, and will conduct the investigations and prepare a report on this project.

C. H. Hudson, Los Angeles, reports that his highway contract near Santa Maria is progressing satisfactorily. He is using a Bucyrus 30-B steam shovel and 30-B Diesel engine shovel. J. O. Bruckbank is night engineer and C. Wiggins is night fireman on the 30-B steam machine, and the day shift is William Fox, engineer, and C. W. Wood, fireman. J. B. Newton is handling the day shift on the 30-B Diesel and J. Johnson the night shift.

George Peck is running a 70-ton shovel, Mr. Lightsey a 50-B and Mr. W. Moore a 30-B on Hamilton & Sprague's railroad contract for the Santa Fe near Redondo Beach, California.

The Consumers Rock & Gravel Company is operating a 50-B shovel at Hewitt, California, the shovel runner being W. L. Shannon, the fireman, Lou Yunker, and the pitman, R. T. Charlesworth.

St. Louis Items

BY A. B. KOENIG

Cameron, Joyce & Co., Keokuk, Iowa, submitted lowest bid for grading 4½ miles of state road northeast from Mt. Sterling, Illinois.

Joseph Kesl & Son of Edwardsville, Illinois, are low bidders for the construction of 3.10 miles of road work south of White Hall, Illinois.

The Kansas City & Grandview Railroad has been granted authority by the Interstate Commerce Commission to proceed immediately with the construction of a 12-mile line between Leeds, a suburb of Kansas City, Missouri, and Grandview, also in Missouri. Both points are on the Kansas City Southern Railroad. The construction will cost approximately $2,500,000. It will decrease the grade over which the Kansas City Southern moves its train and will eliminate a number of grade crossings. The Kansas City Southern will acquire ownership of the new line when completed.

List & Gifford Construction Co. of Kansas City were low bidders for constructing a reinforced concrete girder bridge and the reinforced concrete substructure and approach for a steel bridge on Section 10, Route 31, Brown and Scuyler Counties at the Springfield letting September 27th. Their bid was $46,500. The Illinois Steel Company of Jacksonville, Illinois, with a bid of $13,500, are low for the steel superstructure.

The Medaris Construction Co. of Greenfield, Illinois, submitted lowest bid for constructing one reinforced concrete girder bridge, one reinforced concrete box extension and three reinforced concrete box culverts in Morgan County, Illinois.

The Chicago Heights Coal Co. are moving an outfit from Elkhart to Wolf Creek, Illinois, on state highway.

Harry Henske, Merchants Laclede Building, St. Louis, submitted lowest bid for construction of culvert near the Wabash Railroad and Delmar Avenue crossing at the Board of Public Service here on September 25th. His bid was $150,765.50.

E. H. Riebe will construct a temporary steel bridge northeast of Lincoln, Illinois.

Gravel and rock contracts recently let by the State Highway Department at Jefferson City, Missouri, were as follows: Old Monroe Gravel Company, Lincoln County, 25,000 tons gravel, minimum, at 35c a ton at the pits: Independent Gravel Company, Carthage, Missouri, 50,000 tons crushed stone, minimum, at 90 cents a ton at the quarry; Phoenix Stone Company, Green County, 50,000 tons crushed stone, minimum at 90 cents a ton at the quarry.

P. J. Murphy is finishing his bridge filling and culvert jobs on the Wabash Railroad. He has 27 small subs distributed along this road.

W. H. Wignall expects to finish his grading contract at Moberly, Missouri, in a couple of weeks. He wants another job suitable for a 12-team outfit.

Beamer & Vanhorne have 35,000 yards of grading to let at Fulton, Missouri.

Wm. Burton Construction Co., 4406 South 28th Street, Omaha, Nebraska, has 10 teams, a machine and caterpillar tractor about idle.

Wm. Brothers is working on 5 miles of state highway near Kimmswick, Missouri.

Dan Culp has his outfit at work on state highway in Madison County, Missouri.

A. L. Cook of Ottawa, Kansas, made us glad with a visit the other day. Nothing new.

J. W. Molloy, Route 1, Box 105, East St. Louis, Illinois, has an 8-team outfit idle.

Chester Bondurant, an old-time contractor but now farming in Kentucky, came to St. Louis for a lot of cotton pickers. Koenig sent him back happy.

Louis Rich Construction Co. report their various road jobs in Illinois and Missouri as getting along nicely and making rapid progress towards completion.

W. F. Schulz, Consulting Engineer, 870 Shrine Building, Memphis, Tennessee, is taking bids on excavating about 75,000 yards of earth for a subway and the approaches thereto under the tracks of the Union Railway Co., Nashville, Chattanooga & St. Louis, St. Louis-San Francisco Railroad and the Southern Railway System. This work is to be done for the joint railroads interested. Work can be done with small caterpillar steam shovels and dump wagons or possibly narrow gauge equipment. Work is also suitable for a larger shovel and a standard gauge equipment. It can also be done with dragline and standard car equipment. Contractors interested in this get in touch with Mr. Schulz at once.

Contractors when in want of work or labor for their outfits write or wire Koenig Labor Agency, 612 Walnut Street, St. Louis, Missouri, or 501 Delaware Street, Kansas City, Missouri.

Canada

Montreal and Vicinity

BY J. M. WARD

The Federal Construction Co., Limited, Toronto, have secured the contract for the Donnacona cut-off of the Canadian National Railways. This is a six-mile job and very heavy work.

We had a visit the other day from J. R. Hagelin, Vice-President of the Carswell Construction Co., Toronto. Mr. Hagelin is at present constructing a stretch of gravel road for the Quebec Highways Department. They have installed industrial railways for hauling the gravel, and they hope to finish this work this year.

The Back River Power Co., Montreal, expect to call for tenders for the hydro-development work near Montreal.

The Downing Cook Construction Co., Montreal, have taken contract for dam which is being constructed on the hydro-electric development work for the Hollinger Gold Mines. The general contractors are Sir Wm. Arrol & Co., who have sublet the excavation to R. B. Stewart.

The hydro-development work and construction of Pulp Mills in Newfoundland is going ahead rapidly. The Northern Construction Co., Vancouver, Fraser, Brace, Limited, Montreal, and the Wm. I. Bishop Co., Montreal, are co-operating with Sir W. G. Armstrong Whitworth Co. interests on this work.

The Quebec Development Company is making good progress at St. Joseph d'Alma. Mr. Cothran, Vice-President and Manager, in charge of the work, is kept pretty busy.

The Dominion Government Department of Public Works expect to call for tenders shortly for $1,000,000 breakwater extension at Negro Point, St. John, New Brunswick.

Tenders are being received up to November 7th for a $1,200,000 grain elevator and conveyor galleries, to be erected by the Dominion Government Department Trade and Commerce, at Halifax, Nova Scotia.

Dominion Government Department of Public Works are receiving tenders for new wharf at Baie St. Paul, Quebec.

Toronto and Vicinity

BY C. E. ENGLAND AND N. DE WIND

The Northern Canada Power Company of Toronto, Ontario, reports that very satisfactory progress is being made on their new hydro-electric power development on Quinze River, and that the contractors are approximately eight weeks ahead of the schedule set. Messrs. Morrow & Beatty are the general contractors for construction work.

Works Commissioner Harris has announced that his report on sewer system for North Toronto will shortly be ready. This embodies alternative schemes to the report submitted some time ago, which involves $9,000,000 to $11,000,000.

It is reported that the Grand Trunk Railroad have made an agreement with the City of Toronto for the widening of roadways at Sunnyside.

Mr. W. A. McLean, Deputy Minister of Public Works, Toronto, Ontario, has resigned that position after many years service with the Province. He was the first Provincial Highway Engineer appointed under the old Highway Improvement Act. The Provincial Government has appointed Mr. S. L. Squire to succeed him as Deputy Minister. Mr. Squire was formerly connected with the Department but resigned prior to the 1919 election, and amongst his other activities has been President of the Canadian Good Roads Association.

The Canadian National Railways have awarded a contract for construction of the cut-off at Donnacona, Quebec, to the Federal Construction Co., 131 Bay Street, Toronto. Mr. Huffman of that Company, advises us as we go to press that he cannot make any definite announcement as to when grading work will commence.

It is announced that the Canadian Pacific Railway has plans ready for grade separation northwest of the City of Toronto.

It is reported at Swastika, Ontario, that the Larder Lake extension of the Toronto & Northern Ontario is ready for track laying and that the contractor's equipment will be running over the new part of the road shortly. The right-of-way has been cut as far as Crown Reserve. The Sinclair Construction Co. are the general contractors.

As we go to press, tenders are being received at Trenton, Ontario, for excavating a tail-race channel at Dam No. 9 on the Trent River.

Scarboro Township has decided to widen Kingston Road from the city limits of Toronto, Ontario, to the new highway at Stop 24. The Utilities Commission have appointed a Committee to consult with the Provincial Highway Department. It is proposed to run the Radial Railway lines down the centre of the widened highway.

The Bell Telephone Co. propose laying a new long distance cableway between Toronto and Hamilton, which will increase generally the service capacity through the Niagara Peninsular. The estimated cost of this special construction is $750,000.

Amongst our visitors during this month at Toronto was Mr. J. M. Ward of Montreal office, who spent a day here on his way back from a business trip to Chicago.

Winnipeg and Vicinity

BY F. X. AMOSS

The J. MacDiarmid Co., Limited, Winnipeg, have been awarded the contract for completion of the power house at the hospital for mental diseases, at Selkirk.

Mr. Stuart McKenzie, formerly Consulting Engineer in Winnipeg and recently Field Engineer for the Manitoba Power Company at Great Falls, Manitoba, has joined the Dominion Engineering & Inspection Company of Montreal.

Grant Smith, head of Grant Smith & Co., and McDonnell, Limited, the well-known railway contractors of Vancouver, British Columbia, died suddenly at St. Paul, Minnesota, on September 27, aged 55. Grant Smith, who was one of the best known contractors in Western Canada made his home in Seattle, although at one time he spent most of his time in his private car visiting the various contracts which he had on hand. He was intimate with James J. Hill, Sir William Van Horne and other railway pioneers in Canada and across the line. Irrigation works, harbor works, railroad and bridge building were among his chief activities, although several big office buildings have also been erected by the firm in various parts of the continent. Grant Smith built the harbor works at Victoria, British Columbia, the Great Northern Docks and Station at Vancouver, part of the Catskill aqueduct, irrigation works at Brooks, and Lethbridge Northern Irrigation System. At the present time the firm is constructing one of the largest traffic bridges in the province at Revelstoke, for the British Columbia provincial government.

The contract for the new road construction between Winnipeg and Emerson was awarded to A. R. Boivin & Company.

Winnipeg turned out en masse to hear The Right Honorable David Lloyd George during his all too brief visit to Winnipeg on October 13th and 14th.

TRADE NOTES

Link-Belt Company and Meese & Gottfried Company Announce Consolidation

Charles Piez, President of the Link-Belt Company, Chicago, announces the purchase of the Meese & Gottfried Co., of San Francisco, Los Angeles, Seattle and Portland.

For the past ten years Link-Belt Company has been distributing its products on the West Coast through its subsidiaries, the Link-Belt Northwest Company, of Seattle, and the Link-Belt Pacific Company, of San Francisco. The improvement in distributing facilities effected by the consolidation, and the additional manufacturing facilities acquired, should give the rapidly-growing industries of the Pacific Coast highly economical and efficient service.

Meese & Gottfried Co., and its predecessors, have been manufacturers of power transmission machinery and distributors of conveying and transmission machinery on the Coast for more than forty years, and were well and favorably known from the Canadian to the Mexican borders. It is the intention of the new owners to add to the facilities and enlarge present stocks, so that prompter service to its customers will be insured.

The new organization will be known as Link-Belt Meese & Gottfried Co., with headquarters at San Francisco.

REVIEW OF BOOKS and CATALOGS

We shall be glad to review, in this column, such books and catalogs as are sent to us.

Architects, builders and contractors have long wanted a comprehensive, yet practical, book on the use of concrete building units — a book which would tell how to distinguish well-made units and how to use them.

Such a book has now been published by the Portland Cement Association in "A MANUAL OF CONCRETE MASONRY CONSTRUCTION." A careful examination of this book will, we believe, earn for it a permanent place in your working library.

Special attention is directed to the many excellent illustrations of construction details, the tables of manufacturers of block and tile machines, together with shapes and dimensions of units made by them, and the specifications for concrete block and tile and Portland cement stucco.

This 32-page book is of letter size — convenient for filing. Copies may be obtained free by addressing *The Portland Cement Association, 111 West Washington Street, Chicago, Illinois.*

HALF-BAG TILTING MIXER — A descriptive pamphlet on the Smith 4-S Half-Bag Tilting Mixer has just been issued by *The T. L. Smith Company, Milwaukee, Wisconsin.* In addition to pointing out the several features which are unusual in a machine of this small size, there are views of both the two-wheel style and the four-wheel style, showing these mixers on some of the many jobs for which they are well adapted.

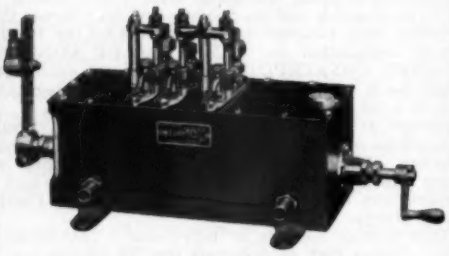
HISEY CATALOGUE No. 3027 — 32-page miniature catalogue briefly describes the complete line (112 different sizes and types) of HISEY products. This has been prepared principally for our dealers and agents, who know the value and necessity of placing complete, condensed and practical information in the hands of all customers and prospects. This booklet may be obtained by writing to the *Hisey-Wolf Machine Co., Cincinnati, Ohio.*

BLAW-KNOX SINGLE LINE BUCKETS — A beautifully illustrated 36-page booklet containing interesting and valuable information concerning the Single Line Bucket, including the foundry type, bridge type, cableway type, etc. It is beautifully illustrated with various photographs showing actual installations of the various types and contains in the text, description of the many uses to which these types may be put. The book should prove to be very helpful to those interested in the possible purchase of this type of equipment and may be obtained by writing to the *Blaw-Knox Co., Pittsburgh, Pa.*

The Asphalt Association has recently published a series of bulletins entitled "HOW AMERICAN CITIES ARE PAVED," "USES OF ASPHALT IN HIGHWAY CONSTRUCTION," "ASPHALTIC CONCRETE BASE MAKES POSSIBLE RAPID PAVING PROGRAM." These booklets may be obtained free of charge from *The Asphalt Association, 25 West 43d Street, New York City, New York.*

SMITH MIXERS — *The T. L. Smith Company, Milwaukee, Wisconsin,* is distributing a small folder descriptive of two of the Smith line of concrete mixers — the new 4-S Tilter (half-bag) and the 7-S Non-Tilting Mixer (full-bag). Special reference is made to the newly designed and much simplified device which is now used on the 7-S for operating the discharge chute.

Takes the Guess Out of Your Lubrication Problem



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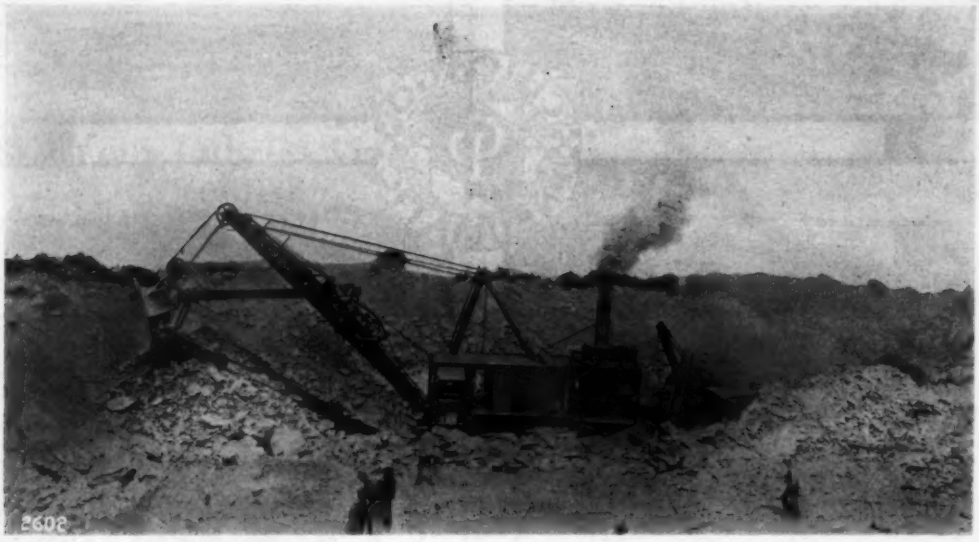
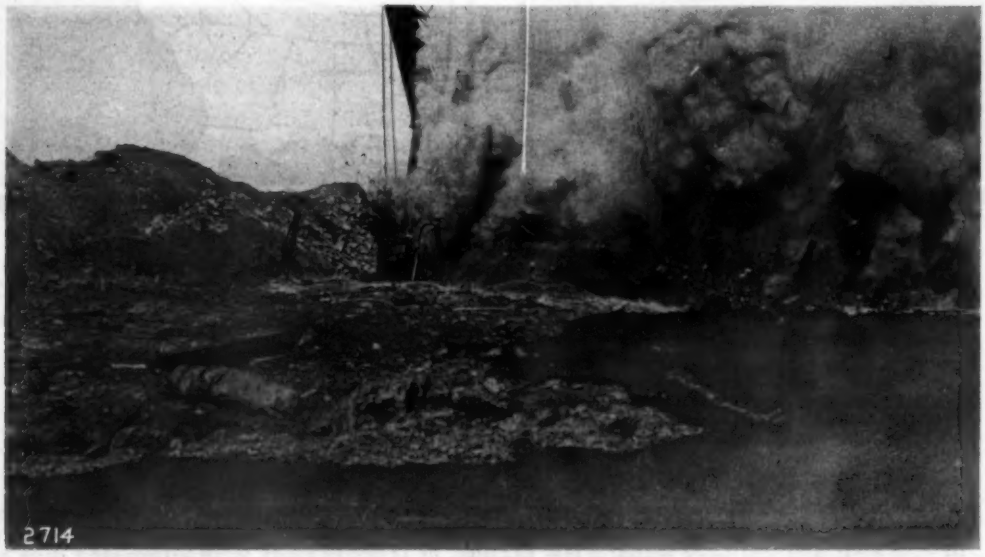


View of Bucyrus 80-B stripping shovel, mounted on caterpillars, overcasting rock. This machine is being followed by a Bucyrus 35-B.



Making a shot. Blasting ahead of the Bucyrus 80-B. Note the boom in the background.

Views of the D. B. Gore Company, Inc., Strip Mine Operations at Diamond, Kentucky